

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 2 and 4-15 remain pending in the application. Claims 2, 8-10, 13 and 14 have been amended to better define the claimed subject matter.

Applicants submit amended claim 2 in which: the function used to determine the minimum distance between channels has been clarified to include its goal, e.g. to make the loss of information not abrupt. The added limitation finds supported at the original specification (page 6, lines 14-15). In addition, claims 8, 9, 10, 13 and 14 have been amended to recite the similar feature mentioned above.

Further, claim 2 has been amended to recite that the sum of channel C_n widths I_n is equal to that of the signal L . The added limitation finds support at the original specification (page 5, lines 25-26)

Claims 2 and 4-15 are rejected under 35 USC §103(a) as being unpatentable over Laamanen et al. (WO/98/58471) (see IDS) in view of Kumar et al. (US 7,046,694) (hereafter Kumar).¹ Applicants note that there is an inconsistency between the inventors Laamanen and Lindholm and International Publication Nos. WO/00/31939 and WO/98/58471. In the IDS filed on June 17, 2005, Laamanen is the first inventor for International Publication No. WO/00/31939 and Lindholm is the first inventor for International Publication No. WO/98/58471. Clarification is respectfully requested.

Applicants have assumed that the Examiner has applied Laamanen (WO/00/31939). Applicants respectfully traverse this rejection for the reasons discussed below.

¹ See Office Action, item 4 at page 2.

Applicants respectfully submit that Laamanen fails to disclose or suggest a method and an apparatus of modulating a digital signal comprising: separating the digital signal into N blocks and distributing each block of digital signal over the associated channel, as recited in claims 2 and 8.

Laamanen appears to disclose a signal that is entirely modulated over each sub carriers (Laamanen, page 3 lines 1-5). A signal is not divided into N blocks but is “distributed over N branches that are modulated each into its own subchannel” (Laamanen, page 3, line 3-4). On the contrary, claim 2 requires that the signal is divided into N blocks and a given block of the signal is modulated on a given sub carrier. The motivation is to make the loss of information not abrupt.

Further, Applicants disagree with the Examiner’s rationale that the proposed combination of Kumar and Laamanen discloses a method of modulating a digital signal of width L in frequency on a given useful frequency band “wherein the predetermined minimum distance between the channels is determined as a function of the number N of channels, of their width I_n , and of a mean width of the frequency band affected by the phenomenon of flat fading”.

The Examiner quotes Kumar, col.19 lines 42-50 to allege that there is “a relationship between the distance and the bandwidth”. Thus, Kumar discloses a relation between the distance separating antennas and the RF carrier wavelength of the signal whereas the present application claims that a distance between the channels defined by the method of modulation is determined as a function of their width I_n .

Applicants point out that a distance between frequency channels is not comparable to a distance between antennas, the technical problem being solved by the present application being to efficiently determine the arrangement of sub channels within the signal bandwidth in order that the phenomenon of flat fading affects a minority of blocks (see, Specification, page 6, lines 12-17).

The Examiner quotes Kumar, col.22 lines 25-35 to allege that there is “a relationship between the number of channels and distance”. Kumar teaches a DAB signal composed of 48 modulated orthogonal signals that all have a width of 450 kHz. The distance between channels is, therefore, fixed to a constant value. (See, page 4 of the Office Action). On the contrary, the present application teaches that “the minimum distance between the channels C_i and C_{i+1} may be different from the predetermined distance between the channels C_j and C_{j+1} ” (page 6, lines 6-8). In other words, the claimed feature, i.e., “the predetermined minimum distance between the channels is determined as a function of the number N of channels, of their width I_n , and of a mean width of the frequency band affected by the phenomenon of flat fading”, differs from Kumar.

The Examiner further quotes Kumar, col. 23 lines 60-67 to allege that “bandwidth of sub carriers is considered into flat fading”. One of the technical problems solved by the present application is to distribute blocks of signals b_n over channels C_n in order to minimize the effects of flat fading. In order to solve this problem, the “minimum distance between the channels is determined as a function of the mean width of the frequency band affected by the phenomenon of flat fading”, as recited in claims 2 and 8. Kumar discloses the use of COFDM signals and explains that the narrowness of the COFDM sub bands leads to modelling the effects of multipath fading as a flat-fade for each subcarrier but does not disclose or suggest that the distance between those subcarriers would be determined thanks to the knowledge of the frequency band affected by the phenomenon of flat fading.

The solution disclosed by Kumar is based on the use of the upper and lower sideband frequency regions for a conventional broadcast analog FM-band. Redundant source bit information is transmitted in both the upper and lower sidebands so that the loss of information is minimized. The distance between upper and lower sidebands is somewhat fixed (see Kumar col. 7 lines 16 to 35 and figure 6) and is not determined in

order to avoid the frequency band affected by flat fading. Thus, the solution disclosed by Kumar is different from the present application.

Accordingly, for the reasons discussed above, claims 2 and 8 should be patentable under 35 U.S.C. 103(a) over Laamanen and Kumar and the rejection should be withdrawn.

Independent claims 9-10 and 13-14 recite the similar features to those of claim 2, therefore, claims 9-10 and 13-14 should also be patentable for the reasons with respect to claims 2 and 8.

Dependent claims 4-7, 11-12 and 15 depend upon claims 2 and 10 and should be patentable for at least the reasons advanced with respect to claims 2 and 10.

All rejections having been addressed, it is respectfully submitted that the present application should be in condition for allowance and a Notice to that effect is earnestly solicited.

Early issuance of a Notice of Allowance is courteously solicited.

The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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